10

15

20



1. A video data compression apparatus comprising: an indicator data calculating means for calculating indicator data indicating a complexity of video data for every picture from noncompressed video data;

a target value calculating means for calculating a target value of an amount of data after compression of said video data for every picture based on said calculated indicator data; and

a compressing means for compressing said noncompressed video data so that the amount of data after compression becomes said calculated target value.

2. A video data compression apparatus according to claim 1, wherein:

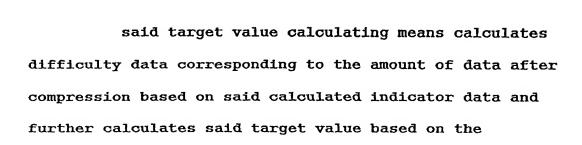
said compressing means compresses said video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture or a combination of them) in a predetermined order;

said indicator data calculating means calculates an ME residual as said indicator data of the pictures to be compressed to the P picture and B picture and calculates a flatness and an intra AC data or one of the same as said indicator data of a picture to be

25 compressed to an I picture; and

10

15



3. A video data compression apparatus according to claim 1, wherein:

said indicator data calculating means
calculates an activity as said indicator data of the I
picture of said video data.

calculated difficulty data.

4. A video data compression apparatus according to claim 1, further comprising

a delaying means for delaying said video data for a predetermined time and then outputting the same;

- said target value calculating means calculates
 said target value with respect to a picture output by
 said delaying means based on said indicator data
 calculated during a period where said delaying means
 delays said video data; and
- 20 said compressing means compresses pictures output by said delaying means so that the amount of data after compression becomes said calculated target value.
 - 5. A data compression method comprising the steps of:
- 25 calculating indicator data indicating a



complexity of video data for every picture from noncompressed video data;

calculating a target value of an amount of data after compression of said video data for every picture based on said calculated indicator data: and

compressing said video data by a predetermined compression method so that the amount of data after compression becomes said calculated target value.

6. A video data compression method according to 10 claim 5, wherein:

said compressing step compresses said video data to a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture or a combination of the same) in a predetermined order;

said indicator data calculating step calculates an ME residual as said indicator data of pictures to be compressed to a P picture and B picture and calculates a flatness and intra AC data or one of the same as said indicator data of a picture to be compressed to an I picture;

said data amount target value calculating step further has a step for calculating difficulty data corresponding to the amount of data after compression based on said calculated indicator data; and

25 said target value is calculated based on the

15

20





calculated difficulty data.

7. A video data compression method according to claim 5, wherein:

said indicator data calculating step calculates

an activity as said indicator data of the I picture of
said video data.

8. A video data compression method according to claim 5, wherein:

it further comprises a step of delaying said

video data by a predetermined time and then outputting
the same:

said data amount target value calculating step calculates said target value with respect to a picture delayed and output based on said indicator data calculated during a period where said video data is delayed; and

said compression step compresses the delayed and output picture so that the amount of data after compression becomes said calculated target value.

9. A video data compression apparatus comprising:

an indicator data calculating means for

calculating indicator data indicating a complexity of

video data for every picture;

a difficulty data calculating means for
25 performing a predetermined computation processing for

15

20

25



multiplying a coefficient with said calculated indicator data to calculate difficulty data corresponding to the amount of data after compression of said video data;

a target value calculating means for

5 calculating a target value of the amount of data after compression of said video data for every picture based on said calculated difficulty data;

a compressing means for compressing each of the pictures of said video data by a predetermined compression method so that the amount of data after compression becomes said calculated target value so as to generate compressed video data; and

a coefficient updating means for updating said coefficient based on the amount of data of the generated compressed video data.

10. A video data compression apparatus according to claim 9, wherein:

said compressing means compresses said

noncompressed video data to a picture type sequence

containing a plurality of types of pictures (I picture, P

picture, and B picture or combination of the same) in a

predetermined order; and

said indicator data calculating means
calculates an ME residual as said indicator data of
pictures to be compressed to a P picture and B picture

15

25



and calculates a flatness, intra AC data, and activity or a combination of the same as said indicator data of a picture to be compressed to an I picture.

11. A video data compression apparatus according to 5 claim 10, wherein:

said compressing means has

a quantizing means for quantizing said video data by a quantization value set from an external unit so as to generate said compressed video data and

a quantization value adjusting and setting
means for successively adjusting said quantization value
based on said calculated target value and setting the
same in said quantizing means; and

said coefficient updating means updates said coefficient based on an average value of said quantization values set in said quantizing means of said compressing means, an amount of data of said generated compressed video data, and said calculated indicator data.

12. A video data compression apparatus according to claim 11, wherein

said coefficient updating means has:

a global complexity calculating means for calculating a global complexity based on the average value of said quantization values set in said quantizing means of said compressing means and the amount of data of

10

15



said generated compressed video data and

a coefficient calculating means for calculating said coefficient based on said calculated global complexity and said indicator data.

A video data compression apparatus according to claim 12, wherein:

said coefficient calculating means divides the global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which become a P picture or a B picture after compression said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

A video data compression apparatus according to claim 13, wherein:

said coefficient calculating means adds or subtracts a predetermined offset value with respect to 20 said global complexity and divides the result by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said

25



15. A video data compression method comprising the steps of:

calculating indicator data indicating a complexity of video data for every picture;

performing predetermined computation processing for multiplying a coefficient with said calculated indicator data to calculate difficulty data corresponding to the amount of data after compression;

10 calculating a target value of the amount of data after compression of said noncompressed video data for every picture based on said calculated difficulty data:

compressing each of the pictures of said video

15 data by the compression method so that the amount of

data after compression becomes said calculated target

value so as to generate compressed video data; and

updating said coefficient based on the amount of data of the generated compressed video data.

20 16. A video data compression method according to claim 15, wherein:

said compressing step compresses said video
data to a picture type sequence containing a plurality of
types of pictures (I picture, P picture, and B picture or
combination of the same) in a predetermined order; and

10

20



said indicator data calculating step calculates an ME residual as said indicator data of pictures to be compressed to a P picture and B picture and calculates a flatness, intra AC data, and activity or a combination of the same as said indicator data of a picture to be compressed to an I picture.

17. A video data compression method according to claim 16, wherein:

said compressing step further contains
a step of quantizing the video data subjected
to said predetermined compression processing by a
quantization value set from an external unit so as to
generate said compressed video data and

a step of successively adjusting and setting
said quantization value based on said calculated target
value; and

said updating step updates said coefficient
based on an average value of said adjusted and set
quantization values, the amount of data of said generated
compressed video data, and said calculated indicator data.

18. A video data compression method according to claim 17, wherein:

said updating step

calculates a global complexity based on the
25 average value of said adjusted and set quantization

أ ممدة

--



values and the amount of data of said generated compressed video data and

calculates said coefficient based on said calculated global complexity and said indicator data.

5 19. A video data compression method according to claim 18, wherein:

said updating step divides the global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate a coefficient for the I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

20. A video data compression method according to claim 19, wherein:

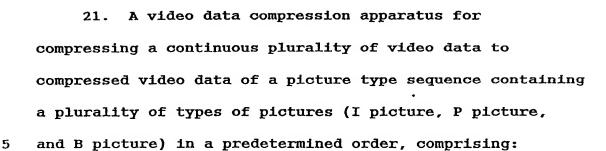
predetermined offset value with respect to said global complexity and divides the result by said generated

flatness, intra AC, or activity to calculate said coefficient for an I picture and divides the global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture and said coefficient for a B picture.

gh sagaran

15

20



a rearranging means for rearranging pictures of said noncompressed video data to an order adapted to the compression method so that each head picture of said video data becomes an I picture or a P picture;

an indicator data calculating means for calculating indicator data indicating a complexity of said rearranged noncompressed video data for every picture;

a border detecting means for detecting a scene change of a continuous plurality of said noncompressed video data;

a changing means for changing said picture type sequence so that pictures of any of said noncompressed video data are compressed without reference to the pictures of said other noncompressed video data for every border of a detected scene change;

a target value calculating means for calculating a target value of the amount of data after compression of said video data based on said calculated indicator data and said picture type sequence after

25

change; and

10



a compressing means for compressing said video data to compressed video data of said picture type sequence after change so that the amount of data after compression becomes substantially said calculated target value.

22. A video data compression apparatus according to claim 21, wherein:

said target value calculating means has

an approximating means for performing predetermined computation processing for multiplying a coefficient with said calculated indicator data to calculate difficulty data corresponding to the amount of data after compression and

a calculating means for calculating a target of
the amount of data after compression of said
noncompressed video data for every picture based on said
calculated difficulty data;

said compressing means has

a quantizing means for quantizing said video

20 data by a quantization value set from an external unit so
as to generate said compressed video data and

a quantization value adjusting and setting
means for successively adjusting said quantization values
based on said calculated target value and setting the

25 same in said quantizing means; and

10

15

20

provision is further made of a coefficient updating means for updating said coefficient based on the average value of said quantization values set in said quantizing means of said compressing means, the amount of data of said generated compressed video data, and said calculated indicator data.

23. A video data compression apparatus according to claim 21, wherein

said target value calculating means has:

a predictive target amount calculating means for calculating said target value in accordance with the type of picture after compression by predicting that pictures contained in the predetermined compression unit are compressed as an order of said picture type sequence in advance before the change of said picture type sequence and

a target amount correcting means for correcting said target value of a picture of said video data of a type of picture which after compression is changed in accordance with the type of the picture after the change in only a case where a change of said picture type sequence actually exists.

- A video data compression apparatus according to claim 23, wherein:
- 25 said indicator data calculating means

10

15

20

25



calculates a flatness, intra AC, and activity as indicator data of a picture which becomes an I picture after compression and an ME residual as indicator data of a picture which becomes a P picture or a B picture after compression;

said changing means changes said picture type sequence so that the picture of the head of said video data is compressed to an I picture when the picture of the head of said video data would be compressed to a P picture; and

said target amount correcting means corrects said target value of a picture of a type of picture after compression which changes from a P picture to an I picture, which is calculated in advance, to said target amount of a picture in a case where it becomes an I picture after compression and corrects said target value of a picture of a type of the picture after compression which changes from an I picture to a P picture, which is calculated in advance, to said target amount of a picture in a case where it becomes a P picture after compression.

25. A video data compression apparatus according to claim 22, wherein

said coefficient updating means has
a global complexity calculating means for
calculating a global complexity based on an average value

Just men and and

25

of said quantization values set in said quantizing means of said compressing means and the amount of data of said generated compressed video data and

a coefficient calculating means for calculating

a coefficient based on said calculated global complexity

and said indicator data.

26. A video data compression apparatus according to claim 25, wherein:

global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate a coefficient for an I picture and divides a global complexity of a picture which becomes a P picture or a B picture after compression by said generated ME residual to calculate a coefficient for a P picture or a coefficient for a B picture.

27. A video data compression method for compressing a continuous plurality of video data to compressed video data of a picture type sequence containing a plurality of types of pictures (I picture, P picture, and B picture) in a predetermined order, comprising the steps of:

rearranging pictures of said noncompressed video data to an order adapted to the compression method so that each head picture of said video data becomes an I picture or a P picture;

15

20

25



calculating indicator data indicating a complexity of said rearranged noncompressed video data for every picture;

detecting a scene change of the continuous

5 plurality of said noncompressed video data;

changing said picture type sequence so that a picture of any of said noncompressed video data is compressed without reference to a pictures of other noncompressed video data for every border of a detected scene change;

calculating a target value of the amount of data after compression of said video data for every predetermined compression unit based on said calculated indicator data and said picture type sequence after change; and

compressing said video data to the compressed video data of said picture type sequence after change so that the amount of data after compression becomes substantially said calculated target value.

28. A video data compression method according to claim 27, wherein:

said target value calculating step performs

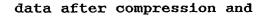
predetermined computation processing for multiplying a

coefficient with said calculated indicator data so as to

calculate difficulty data corresponding to the amount of

15

20



calculates a target of the amount of data after compression of said noncompressed video data for every picture based on said calculated difficulty data;

said compressing step quantizes video data subjected to said predetermined compression processing by a quantization value set from an external unit so as to generates said compressed video data and

successively adjusts said quantization value

10 based on said calculated target value and sets the same;
and

said predetermined coefficient is updated based on the average value of said set quantization values, the amount of data of said generated compressed video data, and said calculated indicator data.

29. A video data compression method according to claim 27, wherein

said target value calculating step calculates said target value in accordance with the type of picture after compression by predicting that pictures contained in said predetermined compression unit are compressed as an order of said picture type sequence in advance before the change of said picture type sequence and

corrects said target value of the picture of said noncompressed video data of a type of picture which

10

15

20



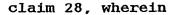
after compression is changed in accordance with the type of the picture after the change in only a case where a change of said picture type sequence actually exists.

A video data compression method according to claim 29, wherein:

said indicator data calculating step calculates a flatness, intra AC, and activity as indicator data of a picture which becomes an I picture after compression an ME residual as indicator data of a picture which becomes a P picture or a B picture after compression;

changes said picture type sequence so that the picture of the head of said video data is compressed to an I picture where the picture of the head of said video data would be compressed to a P picture; and

- corrects said target value of a picture of a type of picture after compression which is changed from a P picture to an I picture, which is calculated in advance, to said target amount of a picture in the case where it becomes an I picture after compression and corrects said target value of a picture of a type of picture after compression which is changed from an I picture to a P picture, which is calculated in advance, to said target amount of a picture in the case where it becomes a P picture after compression.
- 25 31. A video data compression method according to



said coefficient updating step calculates a global complexity based on the average value of said quantization values to be set and the amount of data of said generated compressed video data and

calculates said coefficient based on said calculated global complexity and said indicator data.

- 32. A video data compression method according to claim 31, wherein:
- global complexity of a picture which becomes an I picture after compression by said generated flatness, intra AC, or activity to calculate said coefficient for an I picture and divides a global complexity of a picture which

 becomes a P picture or a B picture after compression by said generated ME residual to calculate said coefficient for a P picture or said coefficient for a B picture.